



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,074	03/01/2002	Chun-Hung Lin	BHT-3111-239	9127

7590 10/25/2004

BRUCE H. TROXELL  
SUITE 1404  
5205 LEESBURG PIKE  
FALLS CHURCH, VA 22041

EXAMINER

WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
----------	--------------

1742

DATE MAILED: 10/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/085,074

Applicant(s)

LIN ET AL.

Examiner

Harry D Wilkins, III

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2004 and 13 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 19-22 and 24-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-22 and 24-26 is/are allowed.
- 6) ☒ Claim(s) 27-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 15 May 2004 (with corrected listing of claims filed 13 August 2004) has been entered.

### ***Claim/Rejection Status***

2. The double patenting rejections of claims 19-26 and 27-35 based on US Patent no. 6,660,138 have been overcome through the filing of the terminal disclaimer on 19 May 2004. The terminal disclaimer filed on 19 May 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US 6,660,138 has been reviewed and is accepted. The terminal disclaimer has been recorded.

3. The rejections of claims 19-26 have been withdrawn in view of Applicant's amendment of claim 19 incorporating the subject matter of previous claim 23, which was only known from US 6,660,138 and Applicant has perfected the foreign priority claim to remove US 6,660,138 as prior art by the filing of a certified English translation of the priority document on 19 May 2004.

***Drawings***

4. Applicant has submitted a proposed correction to the drawings as indicated in the Final Rejection mailed on 24 February 2004. The proposed change has been approved, however, no replacement drawing sheet has been submitted. Applicant is required to submit a new drawing sheet including the changes as indicated on the proposed drawing sheet filed 02 January 2004.

5. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Applicant has not submitted a clean, corrected copy including the proposed changes to Figure 1. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 27-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorincz et al (US 5,958,195) in view of Pelrine (US 5,099,216), Aiura et al (EP 951960) and Sakata et al (US 4,561,185).

Lorincz et al (see abstract, Figures 1 and 3 and col. 2, line 38-col. 3, line 20) teach an electroplating means for an inner surface of a long tube, which is applied to polish the inner surface of the long tube which contains at least one electrode (504) having a cable (80) on one end of the electrode connecting the electrode to a first power source (92), and contains at least two partitions (512) being placed on either side of the electrode. The electrode and partitions are in cooperation with an axial driving mechanism (84) for moving the assembly up and down the tube.

Lorincz et al do not teach a fixed magnet mechanism attached to the electrode and placed between two of the partitions, nor a driving apparatus having plural outer electromagnets nor an axial drive mechanism for moving the driving apparatus.

Perline teaches (see abstract and col. 2, line 52-col. 4, 9) means for controlling the positioning/motion of an object through use of magnetic levitation. The means include a fixed magnet set on the object to be manipulated and a set of adjustable electromagnets surrounding the object to be manipulated. These means allow for reduction of friction and wear and also permit precise control of the positioning of tools. The means provide for motion in any direction and rotation about any axis.

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the magnetic levitation means of Perline into the apparatus of Lorincz et al because the magnetic levitation means reduce friction and wear and allow for precise control of tool positioning, thus providing a more accurate electropolishing method.

It would have been within the expected skill of a routineer in the art to set-up the magnetic levitation means of Perline for the task of moving the electrode of Lorincz et al

Art Unit: 1742

by including a set of fixed magnets on the electrode (the object to be manipulated) in any desired orientation to ensure 360° magnetic force, such as by using a plurality of magnets positioned with a long side parallel with an axis of the long tube, and providing a set of electromagnets outside the tube (surrounding the object to be manipulated) for the purpose of moving the electrode. This is equivalent to the presently claimed driving mechanism. The electromagnets require a power source of their own, thus necessitating a second power source. One of ordinary skill in the art would have been motivated to add an axial driven mechanism for moving the electromagnets up and down the tube because the range of the magnetic interaction would not extend the length of the tube, and thus, the electromagnets would have to be moved with the magnets on the electrode.

However, Lorincz et al and Perline do not teach plural closed fillisters being placed on the second partition, wherein the fillister includes a flexible element and a protruding object supporting an abrasive for grinding the inner surface.

Aiura et al teach (see Fig. 3 and paragraph 37) the grinding of the inner surface of a tube by means of abrasives that are pushed against the inner surface.

Sakata et al teach (see col. 6, lines 34-59) using a thimble and spring set-up to apply a constant pressure.

Therefore, it would have been obvious to one of ordinary skill in the art to have added a grinding apparatus, such as that disclosed by Aiura et al to the apparatus of Lorincz et al and Perline because the apparatus of Aiura et al provides for (see abstract) high precision polishing, and it would have been obvious to one of ordinary skill in the

Art Unit: 1742

art to have used the thimble and spring set-up (fillister) of Sakata et al to apply pressure behind the abrasive elements because the thimble-spring provides a constant pressure thus making the grinding more uniform.

Regarding the amended claim feature that each flexible element presses the abrasive of the protruding object outwardly toward the inner surface of the long tube for grinding, the thimble and spring set-up of Sakata et al would press outwardly the abrasive of Aiura et al against the inner surface of the long tube of Lorincz et al.

Regarding claim 28, Lorincz et al teach (see col. 6, lines 51-54) that the partitions are made of insulating material (i.e.-not electrically conductive).

Regarding claim 29, Lorincz et al teach (see col. 6, lines 62-64) that the partitions may have grooves (516) cut along the periphery of the insulators for facilitating the flow of electrolyte.

Regarding claims 30 and 31, Sakata et al teach (see col. 6, lines 34-59) using a spring and thimble set-up.

Regarding claim 32, though Aiura et al do not teach the composition of the abrasive, it would have been within the expected skill of a routineer in the art to have chosen a conventional abrasive, such as alumina ( $\text{Al}_2\text{O}_3$ ). (For support see paragraph spanning cols. 5 and 6 of Tomari et al.)

Regarding claim 33, Perline teaches (see col. 2, line 52-col. 4, line 9) that the driving apparatus (the electromagnets) is powered by a power device. It would have been within the expected skill of a routineer in the art to have "driven" the electromagnets to keep them in position with the fixed magnet mechanism in order to

Art Unit: 1742

maintain the magnetic levitation effect. Though Lorincz et al are silent about the rotation of electrode, Perline teaches that the means provide six degrees of freedom (x-y-z Cartesian coordinates and rotation about each of these axes) and it would have been obvious to cause the electrode (by means of the fixed magnet mechanism) to rotate in order to ensure a more uniform electropolishing by ensuring that any defects of the electrode are not concentrated in one spot

Regarding claim 34, Perline teaches (see col. 2, line 52-col. 4, line 9) that the magnetic levitation means provide six degrees of freedom (x-y-z Cartesian coordinates and rotation about each of these axes) and it would have been obvious to rotate the driving apparatus "by direct mechanical transmission" to cause the electrode (with the fixed magnet mechanism) to rotate in order to ensure a more uniform electropolishing (by ensuring that any defects of the electrode are not concentrated in one spot thus forming a groove in the tube surface).

Regarding claim 35, Lorincz et al teach (see Fig. 9 and numeral 920) that the partition may include a plurality of holes for fluently introducing the electrolyte.

### ***Response to Arguments***

8. Applicant's arguments filed 19 May 2004 have been fully considered but they are not persuasive. Applicant argued that:

- a. The references as disclosed do not teach that each flexible element presses one abrasive of the protruding object outwardly toward the inner surface of the long tube for grinding.

In response, the abrasive of Aiura et al protrudes outwardly toward the inner surface of the long tube for the purpose of grinding the inner surface of the tube for creating a mirror surface finish (see paragraph 3). The thimble and spring set-up of Sakata et al would allow for the abrasive of Aiura et al to be applied at a constant pressure to the inner surface of the long tube to make grinding more even.

b. There is no motivation to combine the references.

In response, the Examiner has pointed out specific teachings located in the prior art references disclosing the desirability of making the present modifications. Thus, in the Examiner's opinion, there is clear motivation in the prior art for making the proposed modifications, and thus, the rejection is not based on hindsight reasoning.

#### ***Allowable Subject Matter***

9. Claims 19-22 and 24-26 are allowed.
10. The following is a statement of reasons for the indication of allowable subject matter: the limitation of a screw structure attached to the second partition was only taught by Lin et al (US 6,660,138), which has been disqualified as prior art and in addition, the present application is subject to a terminal disclaimer over such patent.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10:00am-8:30pm.

Art Unit: 1742

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry D Wilkins, III  
Examiner  
Art Unit 1742

A handwritten signature in black ink, appearing to read "Harry D. Wilkins, III". The signature is stylized with a large, prominent "H" and "W".

hdw